SPEC CPU®2026 Integer Speed Result

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Lenovo Global Technology

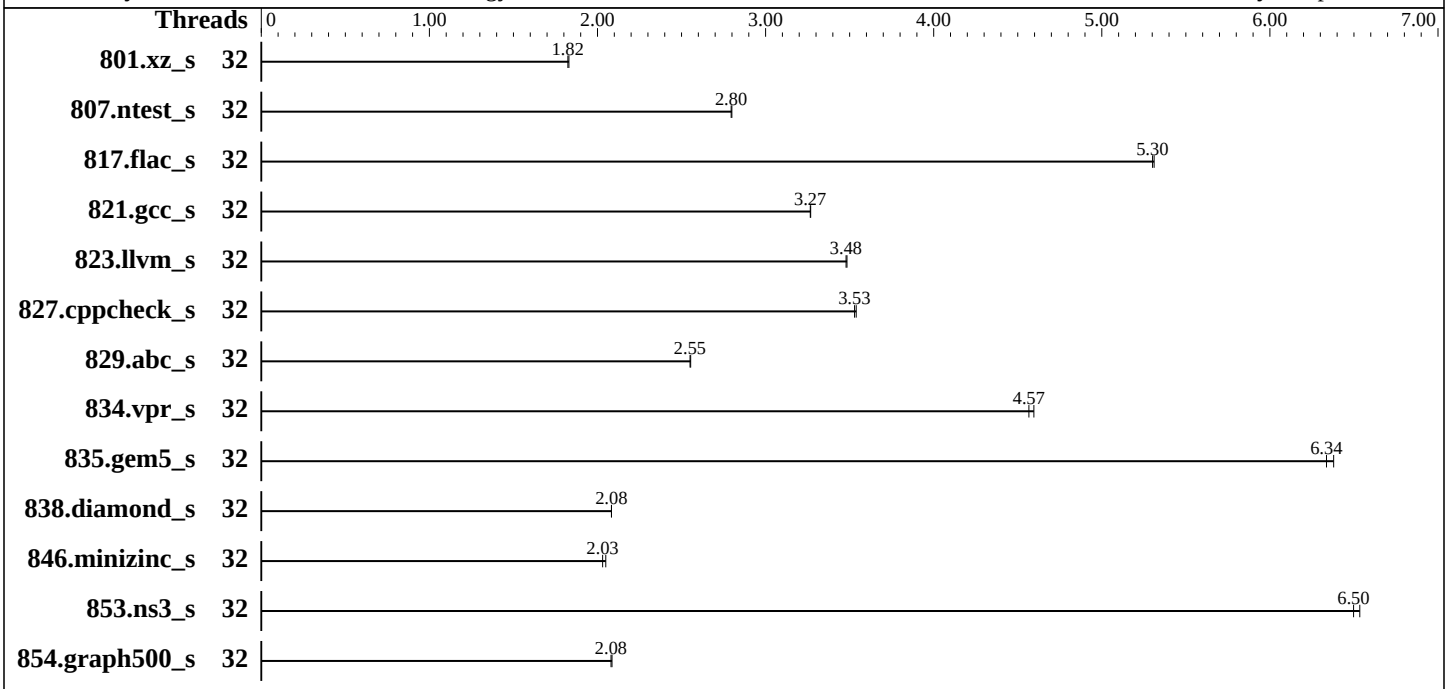
ThinkSystem SR650 V4
(2.80 GHz, Intel Xeon 6503P)

SPECspeed®2026_int_base = 3.25

SPECspeed®2026_int_peak = Not Run

CPU2026 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Aug-2026
Hardware Availability: Aug-2026
Software Availability: Apr-2026



Hardware

CPU Name:	Intel Xeon 6503P
Max MHz:	4300
Nominal:	2800
Enabled:	16 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	64 KB I + 48 KB D on chip per core
L2:	2 MB I+D on chip per core
L3:	48 MB I+D on chip per chip
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx8 PC5-6400B-R)
Storage:	1 x 1.92 TB NVME SSD
Cooling:	Air
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP7 Kernel 6.4.0-150700.51-default
Compiler:	C/C++: Version 2026.0 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2026.0 of Intel Fortran Compiler for Linux
Compiler Category:	Vendor
Firmware:	Lenovo BIOS Version IHE119P 1.51 released Jun-2026
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	jemalloc memory allocator v5.3
Power Management:	BIOS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
801.xz_s	32	323	1.83	**324**	**1.82**									
807.ntest_s	32	407	2.80	**408**	**2.80**									
817.flac_s	32	327	5.31	**328**	**5.30**									
821.gcc_s	32	633	3.27	**634**	**3.27**									
823.llvm_s	32	405	3.48	**406**	**3.48**									
827.cppcheck_s	32	316	3.54	**317**	**3.53**									
829.abc_s	32	**326**	**2.55**	325	2.55									
834.vpr_s	32	**209**	**4.57**	208	4.60									
835.gem5_s	32	179	6.38	**180**	**6.34**									
838.diamond_s	32	**481**	**2.08**	481	2.08									
846.minizinc_s	32	**330**	**2.03**	327	2.05									
853.ns3_s	32	176	6.53	**177**	**6.50**									
854.graph500_s	32	**294**	**2.08**	293	2.09									

SPECspeed®2026_int_base = 3.25

SPECspeed®2026_int_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2026-1.0.1-ic2026.0/lib"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

General Notes

```
 Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
 memory using CentOS Stream 9.
 Transparent Huge Pages enabled by default
 Prior to runcpu invocation
 Filesystem page cache synced and cleared with:
 sync; echo 3>       /proc/sys/vm/drop_caches
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
```

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General Notes (Continued)

```
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
 jemalloc, a general purpose malloc implementation
 built with the CentOS Stream 9, and the system compiler gcc 11.5.0
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS configuration:
Workload Profile set to General Computing - Peak Frequency and then set it to Custom
Page Policy set to Adaptive

 Sysinfo program /home/cpu2026-1.0.1-ic2026.0/bin/sysinfo
 Rev: 779ab21020787073335a329f3a45e2cd
 running on localhost Mon Aug  3 17:18:05 2026

 SUT (System Under Test) info as seen by some common utilities.

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -srvm
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 254 (254.24+suse.148.g83b9060b6e)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 ------------------------------------------------------------

 ------------------------------------------------------------
```

(Continued on next page)

Platform Notes (Continued)

```
1. uname -srvm
  Linux 6.4.0-150700.51-default #1 SMP PREEMPT_DYNAMIC Wed Apr 30 21:35:43 UTC 2025 (6930611) x86_64

------------------------------------------------------------
2. w
   17:18:05 up 3 min,  1 user,  load average: 0.10, 0.06, 0.02
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT

------------------------------------------------------------
3. Username
  From environment variable $USER:  root

------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 2062987
  max locked memory       (kbytes, -l) 8192
  max memory size         (kbytes, -m) unlimited
  open files                      (-n) 1024
  pipe size            (512 bytes, -p) 8
  POSIX message queues     (bytes, -q) 819200
  real-time priority              (-r) 0
  stack size              (kbytes, -s) unlimited
  cpu time               (seconds, -t) unlimited
  max user processes              (-u) 2062987
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize=42
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root [priv]
 sshd: root@notty
 /bin/bash ./02.remote_local_SPECcpu_1.02.sh
 sh Run542-compliant-ic2026.0-lin-sapphirerapids-speedint-base-smt-on-20260429.sh
 runcpu --nobuild --reportable --action validate --define default-platform-flags -c
   ic2026.0-sapphirerapids-cpu2026-1.0.1-speed-20260429.cfg --threads 32 --define cores=16 --tune base -o all
    --define intspeedaffinity --define smt-on --define drop_caches intspeed
 runcpu --nobuild --reportable --action validate --define default-platform-flags --configfile
   ic2026.0-sapphirerapids-cpu2026-1.0.1-speed-20260429.cfg --threads 32 --define cores=16 --tune base
   --output_format all --define intspeedaffinity --define smt-on --define drop_caches --nopower --runmode
    speed --tune base --size refspeed intspeed --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2026.136/templogs/preenv.intspeed.136.0.log --lognum 136.0 --from_runcpu 2
```

(Continued on next page)

Platform Notes (Continued)

```
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2026-1.0.1-ic2026.0

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) 6503P
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 173
    stepping        : 1
    microcode       : 0x1000423
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
    cpu cores       : 8
    siblings        : 16
    2 physical ids (chips)
    32 processors (hardware threads)
    physical id 0: core ids 0-7
    physical id 1: core ids 0-7
    physical id 0: apicids 0-15
    physical id 1: apicids 128-143
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
   virtualized systems.  Use the above data carefully.

------------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.40.4:
  Architecture:                          x86_64
  CPU op-mode(s):                        32-bit, 64-bit
  Address sizes:                         52 bits physical, 57 bits virtual
  Byte Order:                            Little Endian
  CPU(s):                                32
  On-line CPU(s) list:                   0-31
  Vendor ID:                             GenuineIntel
  Model name:                            Intel(R) Xeon(R) 6503P
  CPU family:                            6
  Model:                                 173
  Thread(s) per core:                    2
  Core(s) per socket:                    8
  Socket(s):                             2
  Stepping:                              1
  BogoMIPS:                              5600.00
  Flags:                                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat
                                         pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
                                         pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good
                                         nopl xtopology nonstop_tsc cpuid aperfmperf tsc_known_freq pni
                                         pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
```

(Continued on next page)

Platform Notes (Continued)

```
                                    xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
                                  tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm
                                 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 intel_ppin cdp_l2
                                  ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept
                                  vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm
                                   rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb
                                  intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1
                                      xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                                 split_lock_detect user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida
                                 arat pln pts vnmi avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni
                                  vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57
                                 rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear
                                 serialize tsxldtrk pconfig arch_lbr ibt amx_bf16 avx512_fp16 amx_tile
                                           amx_int8 flush_l1d arch_capabilities
  Virtualization:                          VT-x
  L1d cache:                               768 KiB (16 instances)
  L1i cache:                               1 MiB (16 instances)
  L2 cache:                                32 MiB (16 instances)
  L3 cache:                                96 MiB (2 instances)
  NUMA node(s):                            2
  NUMA node0 CPU(s):                       0-7,16-23
  NUMA node1 CPU(s):                       8-15,24-31
  Vulnerability Gather data sampling:      Not affected
  Vulnerability Itlb multihit:             Not affected
  Vulnerability L1tf:                      Not affected
  Vulnerability Mds:                       Not affected
  Vulnerability Meltdown:                  Not affected
  Vulnerability Mmio stale data:           Not affected
  Vulnerability Reg file data sampling:    Not affected
  Vulnerability Retbleed:                  Not affected
  Vulnerability Spec rstack overflow:      Not affected
  Vulnerability Spec store bypass:         Mitigation; Speculative Store Bypass disabled via prctl
  Vulnerability Spectre v1:                Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:                Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling;
                                           PBRSB-eIBRS Not affected; BHI BHI_DIS_S
  Vulnerability Srbds:                     Not affected
  Vulnerability Tsx async abort:           Not affected

From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
     L1d       48K     768K   12 Data            1    64        1             64
     L1i       64K       1M   16 Instruction     1    64        1             64
     L2         2M      32M   16 Unified         2  2048        1             64
     L3        48M      96M   16 Unified         3 49152        1             64

------------------------------------------------------------
8. numactl --hardware
```

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Platform Notes (Continued)

```
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0-7,16-23
  node 0 size: 257784 MB
  node 0 free: 257019 MB
  node 1 cpus: 8-15,24-31
  node 1 size: 257989 MB
  node 1 free: 257163 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       528152700 kB

------------------------------------------------------------
10. who -r
  run-level 3 Aug 3 17:15

------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.24+suse.148.g83b9060b6e)
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ irqbalance issue-generator
                   kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections nvmf-autoconnect postfix
                   purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked wickedd-auto4
                   wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
  enabled-runtime  systemd-remount-fs
  disabled         autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                   firewalld fsidd gpm grub2-once haveged ipmi ipmievd issue-add-ssh-keys kexec-load lunmask
                   man-db-create multipathd nfs nfs-blkmap rpcbind rpmconfigcheck rsyncd serial-getty@
                   smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures systemd-confext
                   systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd
  indirect         systemd-userdbd wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.4.0-150700.51-default
  root=UUID=93451c52-aed3-4298-88c8-f1fb1952eaf7
  splash=silent
```

(Continued on next page)

Platform Notes (Continued)

```
  mitigations=auto
  quiet
  security=apparmor

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 28:
    Unable to determine current policy
    boost state support:
      Supported: yes
      Active: yes

------------------------------------------------------------
15. sysctl
  kernel.numa_balancing               1
  kernel.randomize_va_space           2
  vm.compaction_proactiveness        20
  vm.dirty_background_bytes           0
  vm.dirty_background_ratio          10
  vm.dirty_bytes                      0
  vm.dirty_expire_centisecs        3000
  vm.dirty_ratio                     20
  vm.dirty_writeback_centisecs      500
  vm.dirtytime_expire_seconds     43200
  vm.extfrag_threshold              500
  vm.min_unmapped_ratio               1
  vm.nr_hugepages                     0
  vm.nr_hugepages_mempolicy           0
  vm.nr_overcommit_hugepages          0
  vm.swappiness                      60
  vm.watermark_boost_factor       15000
  vm.watermark_scale_factor          10
  vm.zone_reclaim_mode                0

------------------------------------------------------------
16. /sys/kernel/mm/transparent_hugepage
  defrag          always defer defer+madvise [madvise] never
  enabled         [always] madvise never
  hpage_pmd_size  2097152
  shmem_enabled   always within_size advise [never] deny force

------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
```

(Continued on next page)

Platform Notes (Continued)

```
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    10000

------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP7

------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2026-1.0.1-ic2026.0
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p3 xfs   1.7T  121G  1.6T   8% /

------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:          Lenovo
    Product:         ThinkSystem SR650 V4
    Product Family: ThinkSystem
    Serial:          0987654321

------------------------------------------------------------
21. dmidecode
  Additional information from dmidecode 3.6 follows.  WARNING: Use caution when you interpret this section.
  The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
  determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
  "DMTF SMBIOS" standard.
  Memory:
    7x Samsung M321R4GA3PB2-CCPEC 32 GB 2 rank 6400
    3x Samsung M321R4GA3PB2-CCPKC 32 GB 2 rank 6400
    6x Samsung M321R4GA3PB2-CCPPC 32 GB 2 rank 6400


------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       Lenovo
   BIOS Version:      IHE119P-1.51
   BIOS Date:         06/11/2026
   BIOS Revision:     1.51
   Firmware Revision: 2.56
```

Compiler Version Notes

```
==============================================================================
C      | 854.graph500_s(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++    | 807.ntest_s(base) 827.cppcheck_s(base) 853.ns3_s(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C | 801.xz_s(base) 817.flac_s(base) 821.gcc_s(base) 823.llvm_s(base)
       | 829.abc_s(base) 834.vpr_s(base) 835.gem5_s(base) 838.diamond_s(base)
       | 846.minizinc_s(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Benchmarks using both C and C++:
icpx icx

Base Portability Flags

834.vpr_s: -fno-fast-math

Base Optimization Flags

C benchmarks:

```
-m64 -std=c18 -Wl,-z,muldefs -Wl,-plugin-opt=-inline-threshold=1500
-xsapphirerapids -mprefer-vector-width=512 -O3 -ffp-model=fast -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-fno-strict-aliasing -fiopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc-5.3.0/lib -ljemalloc
```

C++ benchmarks:

```
-m64 -std=c++17 -Wl,-z,muldefs -Wl,-plugin-opt=-inline-threshold=1500
-xsapphirerapids -mprefer-vector-width=512 -O3 -ffp-model=fast -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -pthread
-fiopenmp -DSPEC_OPENMP -L/usr/local/jemalloc-5.3.0/lib -ljemalloc
```

Benchmarks using both C and C++:

```
-m64 -std=c++17 -std=c18 -Wl,-z,muldefs
-Wl,-plugin-opt=-inline-threshold=1500 -xsapphirerapids
-mprefer-vector-width=512 -O3 -ffp-model=fast -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -fno-strict-aliasing -fiopenmp
-DSPEC_OPENMP -pthread -L/usr/local/jemalloc-5.3.0/lib -ljemalloc
```

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2026/results/flags/Lenovo-Platform-SPECcpu-Flags-V1.2-Birchstream-M.html
http://www.spec.org/cpu2026/results/flags/Intel-ic2026-official-linux64-v1.1.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2026/results/flags/Lenovo-Platform-SPECcpu-Flags-V1.2-Birchstream-M.xml
http://www.spec.org/cpu2026/results/flags/Intel-ic2026-official-linux64-v1.1.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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